FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

March 22 to March 28, 2015 (week 12)

Overall Summary

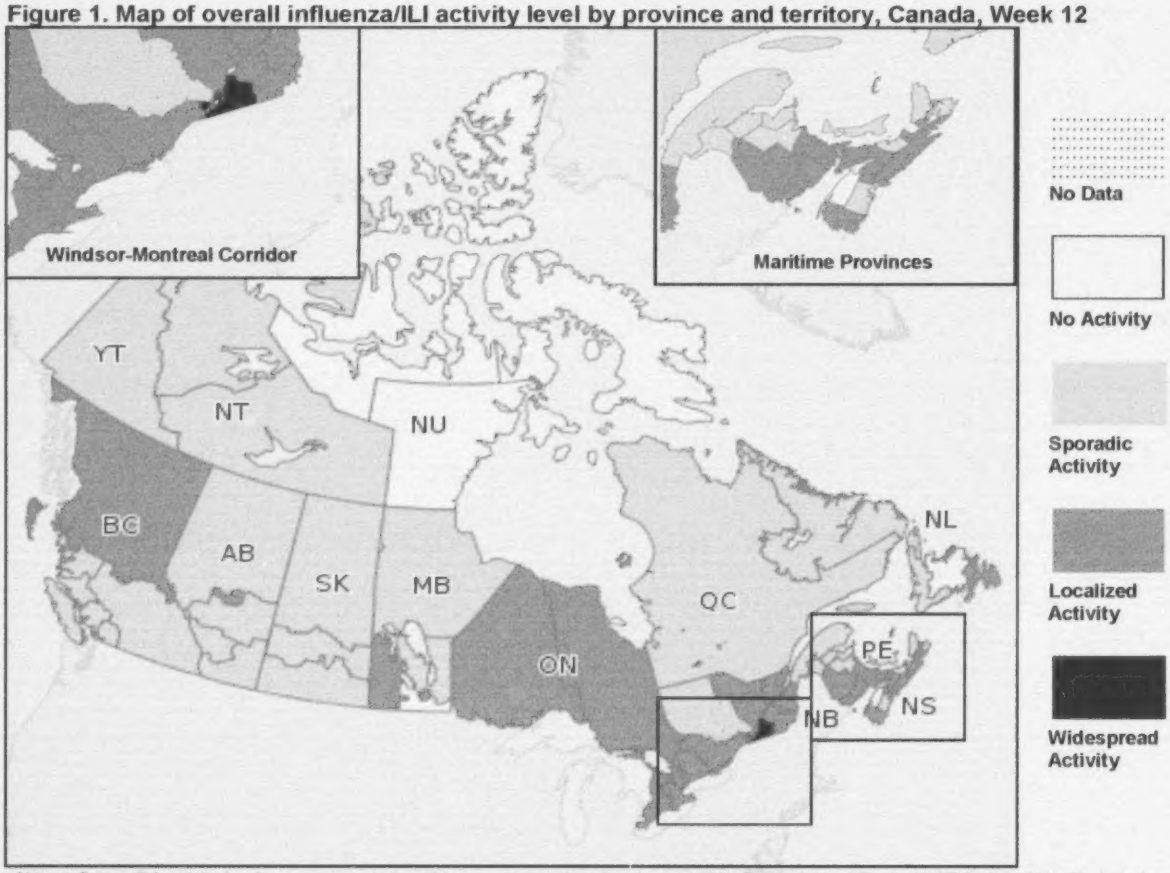
- The majority of influenza activity continues to occur in the Central and Atlantic provinces.
- Influenza B detections continue to increase steadily across Canada while detections of influenza A continues to steadily decrease. This increase in influenza B is expected as influenza B often shows up later in the flu season.
- Influenza B is having a greater impact on adults less than 65 years of age, compared to influenza A(H3N2), which circulated earlier in the season.
- Evidence from the National Microbiology Laboratory (NML) indicates that this year's vaccine will continue to provide protection against the circulating A(H1N1) and B strains.

Are you a primary health care practitioner (General Practitioner, Nurse Practitioner or Registered Nurse) interested in becoming a FluWatch sentinel for the 2014-15 influenza season? Contact us at FluWatch@phac-aspc.gc.ca

Influenza/ILI Activity (geographic spread)

In week 12, two regions in Quebec reported widespread activity. Twenty-two regions reported localized activity: BC, AB, MB(2), ON(7), QC(2), NB(3), NS(5) and NL. Twenty-eight regions reported sporadic activity: in YK, NT(2), BC(4), AB(4), SK(3), MB(2), QC(2), NB(4), NS(3), PE and NF(2). No activity was reported in six regions : NU(3). MB, NS, and NL.

Figure 1. Map of overall influenza/ILI activity level by province and territory, Canada, Week 12

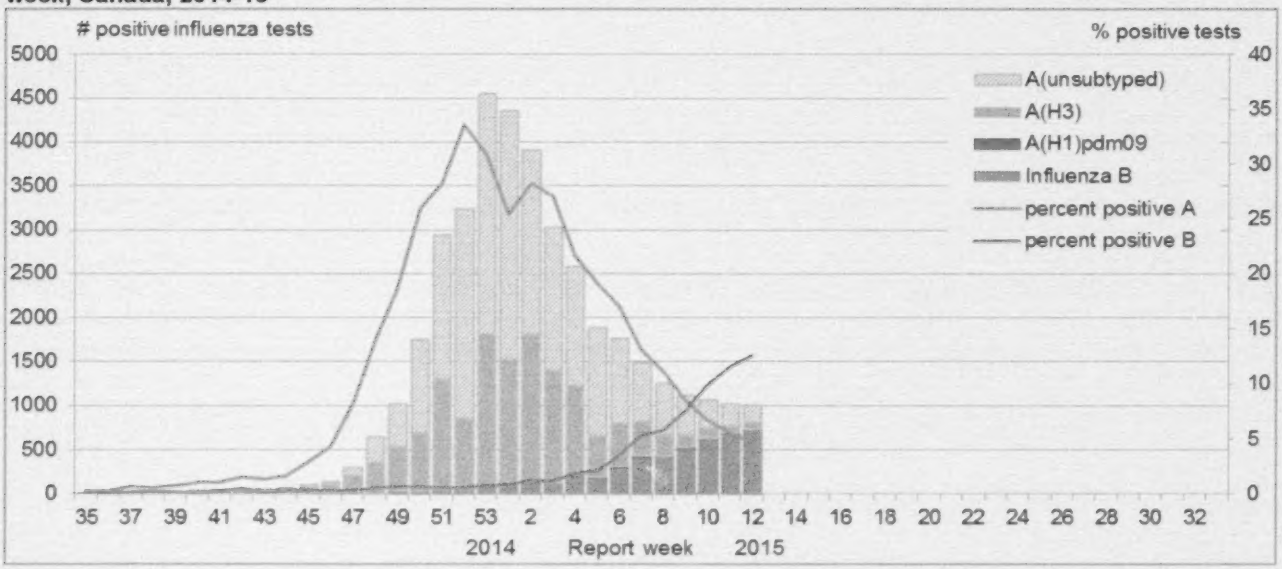


Note: Influenza/ILI activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates and reported outbreaks. Please refer to detailed definitions at the end of the report. Maps from previous weeks, including any retrospective updates, are available on the FluWatch website.

Influenza and Other Respiratory Virus Detections

In week 12, the percentage positive for influenza A (4.7%) continued to decline from the previous week while the percentage of positive influenza B tests continued to increase (11.5%) (Figure 2). Influenza B detections were greater than influenza A in all provinces except NL. To date, 87% of influenza detections have been influenza A, and 99.3% of those subtyped have been A(H3N2) (Table 1). To date this season, detailed information on age and type/subtype has been received for 33,953 cases (Table 2). Adults ≥65 years of age have predominantly been affected by influenza A, accounting for 62% of influenza A detections. Influenza B, while much smaller in numbers, is mainly affecting individuals less than 65 years of age, they account for 60% of influenza B detections.

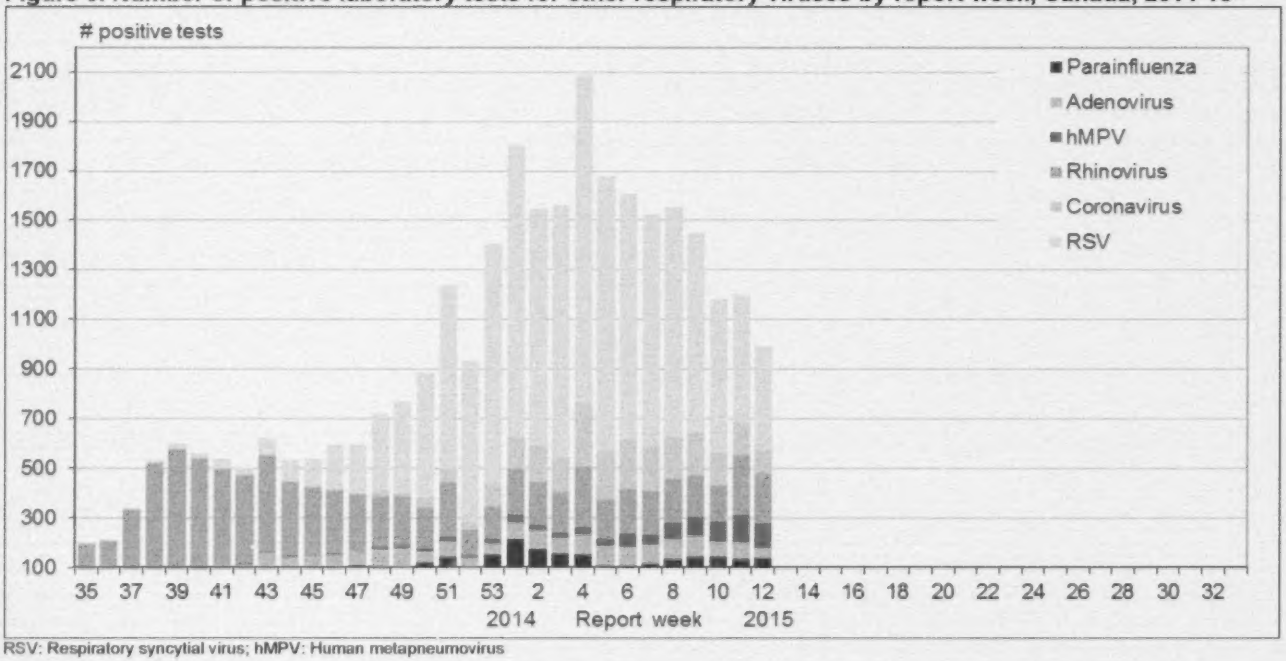
Figure 2. Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, 2014-15



In week 12, detections for all other respiratory viruses remained similar to, or decreased from, the previous week (Figure 3).

For more details, see the weekly Respiratory Virus Detections in Canada Report.

Figure 3. Number of positive laboratory tests for other respiratory viruses by report week, Canada, 2014-15



RSV: Respiratory syncytial virus; hMPV: Human metapneumovirus

Table 1. Weekly and cumulative numbers of positive influenza specimens by type, subtype and province, Canada, 2014-15

Reporting provinces[1]	Weekly (March 22 to March 28, 2015)					Cumulative (August 24, 2014 to March 28, 2015)				
	Influenza A				B	Influenza A				B
	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total
BC	26	0	19	7	32	3488	25	2603	860	297
AB	4	0	3	1	58	3666	13	3502	151	667
SK	0	0	0	0	10	1306	0	837	469	108
MB	1	0	1	0	18	1119	0	389	730	90
ON	88	2	40	46	104	10959	41	4606	6312	626
QC	43	0	0	43	365	11332	4	422	10906	2574
NB	75	0	11	64	80	1117	0	175	942	256
NS	23	0	0	23	29	487	0	123	364	209
PE	0	0	0	0	20	120	1	117	2	46
NL	7	0	0	7	6	610	0	53	557	19
Canada	**267**	**2**	**74**	**191**	**722**	**34204**	**84**	**12827**	**21293**	**4892**
Percentage[2]	27.0%	0.7%	27.7%	71.5%	73.0%	87.5%	0.2%	37.5%	62.3%	12.5%

Table 2. Weekly and cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting[3], Canada, 2014-15

Age groups (years)	Weekly (March 22 to March 28, 2015)					Cumulative (August 24, 2014 to March 28, 2015)						
	Influenza A				B	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	#	%
<5	5	1	0	4	31	2069	19	804	1246	305	2374	7.0%
5-19	4	0	0	4	33	1760	6	945	809	482	2242	6.6%
20-44	6	0	1	5	61	3407	16	1650	1741	669	4076	12.0%
45-64	5	0	1	4	133	3814	17	1631	2166	1107	4921	14.5%
65+	72	0	15	57	178	18514	13	7176	11325	1701	20215	59.5%
Unknown	0	0	0	0	1	120	0	99	21	5	125	0.4%
Total	92	1	17	74	437	29684	71	12305	17308	4269	33953	100.0%
Percentage[2]	17.4%	1.1%	18.5%	80.4%	82.6%	87.4%	0.2%	41.5%	58.3%	12.6%		

[1] Specimens from NT, YT, and NU are sent to reference laboratories in other provinces. Cumulative data includes updates to previous weeks.
[2] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
[3] Table 2 includes specimens for which demographic information was reported. These represent a subset of all positive influenza cases reported.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Antiviral Resistance

During the 2014-2015 influenza season, the NML has tested 1,094 influenza viruses for resistance to oseltamivir and 1,090 influenza viruses for resistance to zanamivir. All viruses were sensitive to zanamivir and one influenza A(H3N2) virus was resistant to oseltamivir. A total of 1,235 influenza A viruses (99.9%) were resistant to amantadine (Table 3).

Table 3. Antiviral resistance by influenza virus type and subtype, Canada, 2014-15

Virus type and subtype	Oseltamivir		Zanamivir		Amantadine	
	# tested	# resistant (%)	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	831	1	827	0	1230	1229 (99.9%)
A (H1N1)	6	0	6	0	6	6 (100%)
B	257	0	257	0	NA[1]	NA[1]
TOTAL	1094	1	1090	0	1236	1235

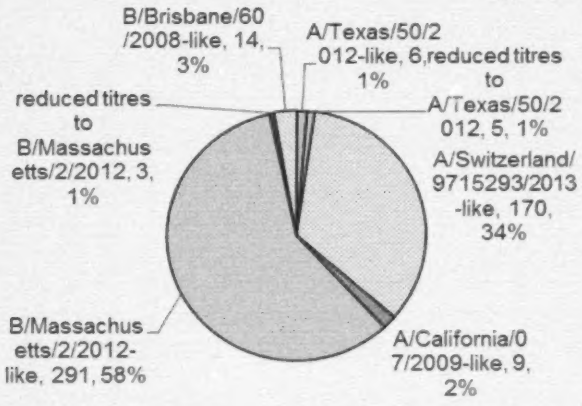
[1]NA: Not Applicable

Influenza Strain Characterizations

During the 2014-2015 influenza season, the National Microbiology Laboratory (NML) has characterized 490 influenza viruses [176 A(H3N2), 9 A(H1N1) and 305 influenza B].

Influenza A (H3N2): When tested by hemagglutination inhibition (HI) assay (n=176), one virus was antigenically similar to A/Texas/50/2012, five showed reduced titers to A/Texas/50/2012 and 170 were antigenically similar to A/Switzerland/9715293/2013, which is the influenza A(H3N2) component recommended for the 2015 Southern Hemisphere influenza vaccine. Additionally, 1025 A(H3N2) viruses were unable to be tested by HI assay; however, sequence analysis showed that 1023 belonged to a genetic group that typically shows reduced titers to A/Texas/50/2012. **Influenza A(H1N1):** Nine A(H1N1) viruses characterized were antigenically similar to A/California/7/2009. **Influenza B:** Of the 305 influenza B viruses characterized, 291 viruses were antigenically similar to B/Massachusetts/2/2012, three viruses showed reduced titers against B/Massachusetts/2/2012, and 14 were B/Brisbane/60/2008-like (Figure 4).

Figure 4. Influenza strain characterizations, Canada, 2014-15, N = 490


B/Brisbane/60 /2008-like, 14, 3%
A/Texas/50/2 012-like, 6,reduced titres to A/Texas/50/2 012, 5, 1%
reduced titres to B/Massachus etts/2/2012, 3, 1%
A/Switzerland/ 9715293/2013 -like, 170, 34%
B/Massachus etts/2/2012-like, 291, 58%
A/California/0 7/2009-like, 9, 2%

The NML receives a proportion of the number of influenza positive specimens from provincial laboratories for strain characterization and antiviral resistance testing. Characterization data reflect the results of haemagglutination inhibition (HAI) testing compared to the reference influenza strains recommended by WHO.

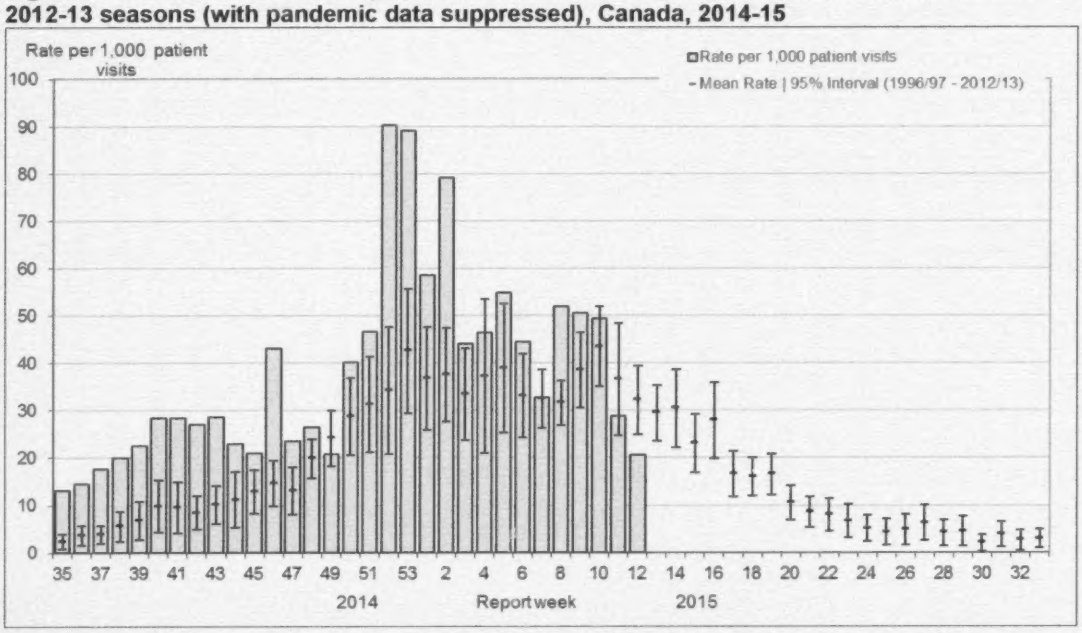
The recommended components for the 2014-2015 northern hemisphere trivalent influenza vaccine include: an A/California/7/2009(H1N1)pdm09-like virus, an A/Texas/50/2012 (H3N2)-like virus, and a B/Massachusetts/2/2012-like virus (Yamagata lineage). For quadrivalent vaccines, the addition of a B/Brisbane/60/2008-like virus is recommended.

The WHO has released the recommended composition of the influenza vaccine for the northern hemisphere for the 2015-2016 season. Trivalent vaccines are recommended to contain 1) an A/California/7/2009 (H1N1)pdm09-like virus 2) an A/Switzerland/9715293/2013 (H3N2)-like virus, and 3) an B/Phuket/3073/2013-like virus(Yamagata lineage). Quadrivalent vaccines are recommended to additionally contain a B/Brisbane/60/2008-like virus (Victoria lineage).

Influenza-like Illness Consultation Rate

The national influenza-like-illness (ILI) consultation rate decreased in week 12 to 20.5 consultations per 1,000, which is below expected levels (Figure 5).

Figure 5. Influenza-like-illness (ILI) consultation rates by report week, compared to the 1996-97 through to 2012-13 seasons (with pandemic data suppressed), Canada, 2014-15

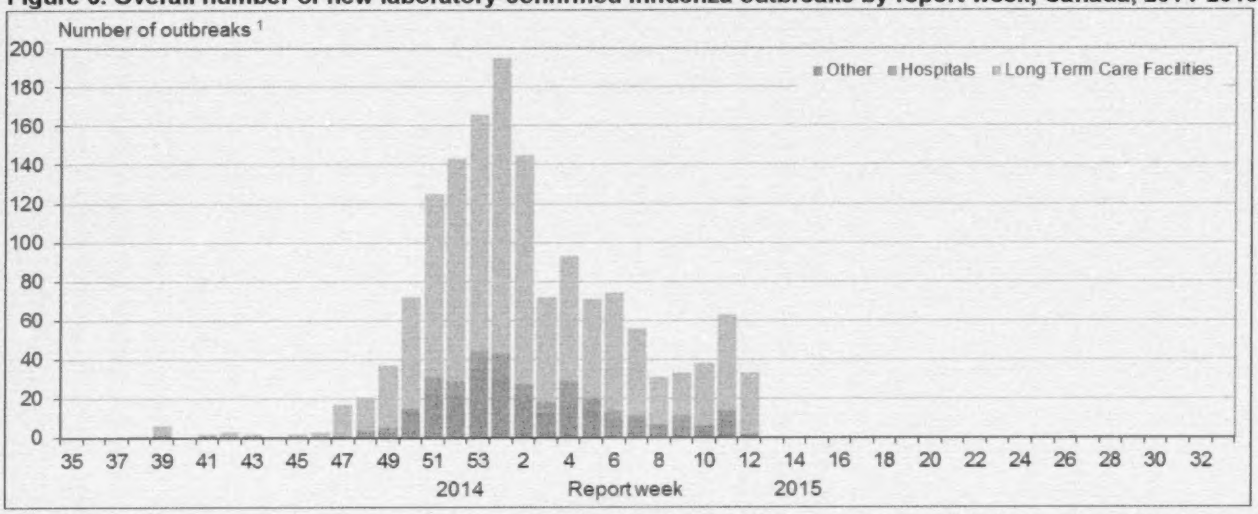


No data available for mean rate for weeks 19 to 39 for the 1996-1997 through 2002-2003 seasons. Delays in the reporting of data may cause data to change retrospectively. The calculation of the average ILI consultation rate over 17 seasons was aligned with influenza activity in each season. In BC, AB, and SK, data is compiled by a provincial sentinel surveillance program for reporting to FluWatch. Not all sentinel physicians report every week.

Influenza Outbreak Surveillance

In week 12, 33 new outbreaks of influenza were reported. The majority of the outbreaks occurred in the Central and Atlantic provinces. Thirty-one outbreaks were reported in long-term care facilities (LTCF) and two in institutional or community settings (Figure 6). Among the outbreaks in which the influenza type was known (n=12), eight outbreaks were associated with influenza B. To date this season, 1,173 outbreaks in LTCFs have been reported and the majority of those with known subtypes were attributable to A(H3N2). There have been a higher number of reported influenza outbreaks to date this season compared to the same period in previous seasons.

Figure 6. Overall number of new laboratory-confirmed influenza outbreaks by report week, Canada, 2014-2015

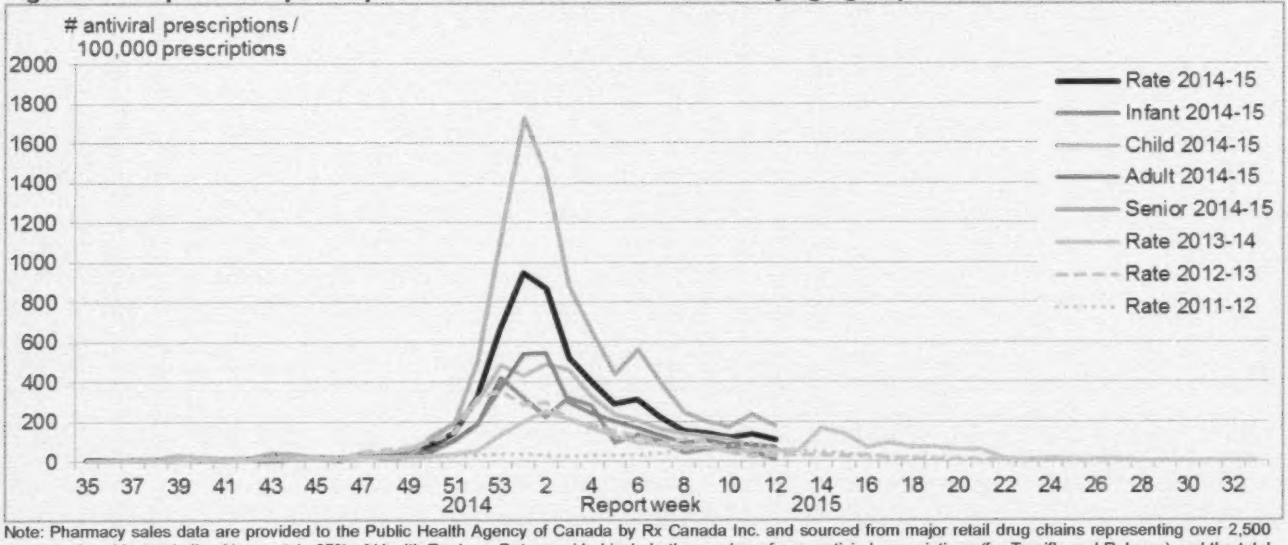


[1]All provinces and territories except NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals. Outbreaks of influenza or influenza-like-illness in other facilities are reported to FluWatch but reporting varies between jurisdictions. Outbreak definitions are included at the end of the report.

Pharmacy Surveillance

During week 12, the proportion of prescriptions for antivirals decreased to 110.0 antiviral prescriptions per 100,000 total prescriptions (from 135.8 per 100,000). The rate for antivirals since week 48 has been higher than the previous three seasons (Figure 7). The rate in all age groups decreased in week 12. The rate was highest among seniors at 176.7 per 100,000 total prescriptions and lowest among infants at 10.4 per 100,000 total prescriptions.

Figure 7 – Proportion of prescription sales for influenza antivirals by age-group and week, Canada, 2014-15



Note: Pharmacy sales data are provided to the Public Health Agency of Canada by Rx Canada Inc. and sourced from major retail drug chains representing over 2,500 stores nationwide (excluding Nunavut) in 85% of Health Regions. Data provided include the number of new antiviral prescriptions (for Tamiflu and Relenza) and the total number of new prescriptions dispensed by Province/Territory and age group. Age-groups: Infant: 0-2y, Child: 2-18y; Adult: 19-64y, Senior: ≥65y

Sentinel Hospital Influenza Surveillance

Paediatric Influenza Hospitalizations and Deaths (IMPACT)

In week 12, 23 laboratory-confirmed influenza-associated paediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network. All 23 cases were influenza B (Figure 8a). A greater proportion of cases have been reported with influenza B in recent weeks, following the trend in laboratory detections. Among the reported cases, five (22%) were <2 years of age, ten (43%) were 2 to 9 years of age and eight (35%) were 10-16 years of age. Three ICU admissions were reported.

To date this season, 621 hospitalizations have been reported by the IMPACT network, 503 (81%) of which were cases of influenza A. Among cases for which the influenza A subtype was reported, 99% (162/164) were A(H3N2) (Table 4). To date, 79 cases were admitted to the ICU, of which 44 (56%) were 2 to 9 years of age (Figure 9a). A total of 51 ICU cases reported to have at least one underlying condition or comorbidity. Four deaths have been reported.

Note: The number of hospitalizations reported through IMPACT represents a subset of all influenza-associated paediatric hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Adult Influenza Hospitalizations and Deaths (PCIRN)

In week 12, 40 laboratory-confirmed influenza-associated adult (≥16 years of age) hospitalizations were reported by the PHAC/CIHR Influenza Research Network (PCIRN) Serious Outcomes Surveillance (SOS) network. Among the cases in week 12, 30 cases (75%) were in adults over the age of 65 and 25 cases (63%) had influenza B (Figure 8b).

To date this season, 2,071 cases have been reported; 1,876 (91%) with influenza A. The majority of cases (82%) were among adults ≥65 years of age (Table 5). One hundred and fifty one ICU admissions have been reported and 113 cases were adults ≥65 years of age. A total of 110 ICU cases (73%) reported to have at least one underlying condition or comorbidity. Of the 114 ICU cases with known immunization status, 38 (33%) reported not having been vaccinated this season. One hundred and twenty one deaths have been reported, 111 (92%) of the deaths were adults >65 years of age (Figure 9B).

Note: The number of hospitalizations reported through PCIRN represents a subset of all influenza-associated adult hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Table 4 – Cumulative numbers of paediatric hospitalizations with influenza reported by the IMPACT network, Canada, 2014-15

Age groups	Cumulative (24 Aug. 2014 to 28 Mar. 2015)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-5m	81	0	18	63	7	88 (14.2%)
6-23m	109	1	35	73	29	138 (22.2%)
2-4y	124	1	40	83	28	152 (24.5%)
5-9y	129	0	44	85	31	160 (25.8%)
10-16y	60	0	25	35	23	83 (13.4%)
Total	503	2	162	339	118	621
% [1]	81.0%	0.4%	32.2%	67.4%	19.0%	100.0%

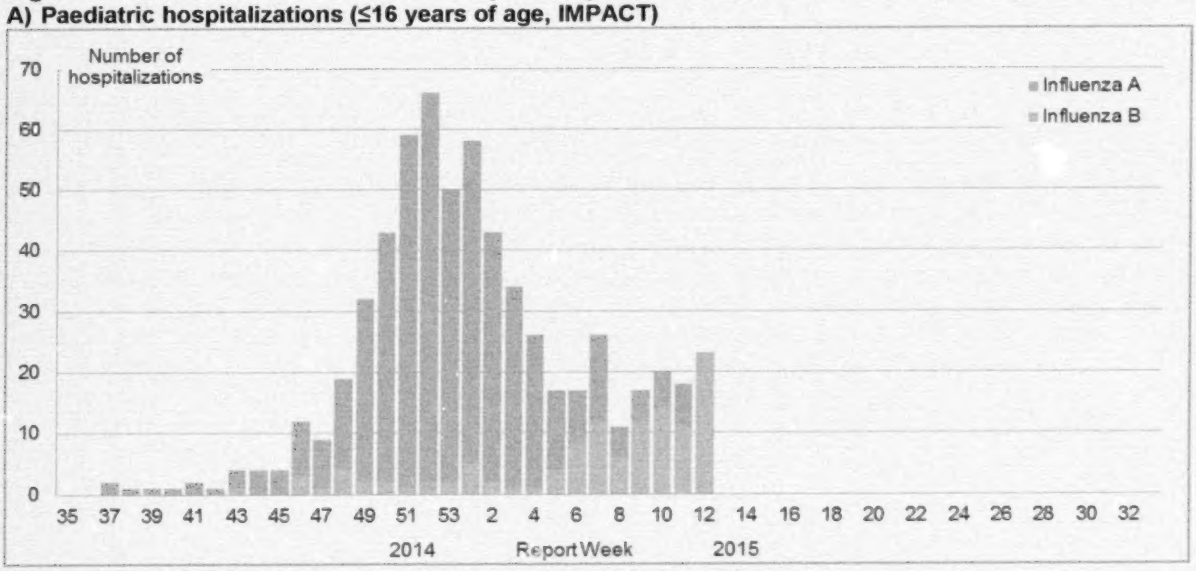
Table 5 – Cumulative numbers of adult hospitalizations with influenza reported by the PCIRN-SOS network, Canada, 2014-15

Age groups (years)	Cumulative (15 Nov. 2014 to 28 March 2015)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A(UnS)	Total	# (%)
16-20	3	0	1	2	1	4 (%)
20-44	104	1	54	49	10	114 (6%)
45-64	214	1	92	121	48	262 (13%)
65+	1555	3	732	820	136	1691 (82%)
Total	1876	5	879	992	195	2071
%	91%	0%	47%	53%	9%	100%

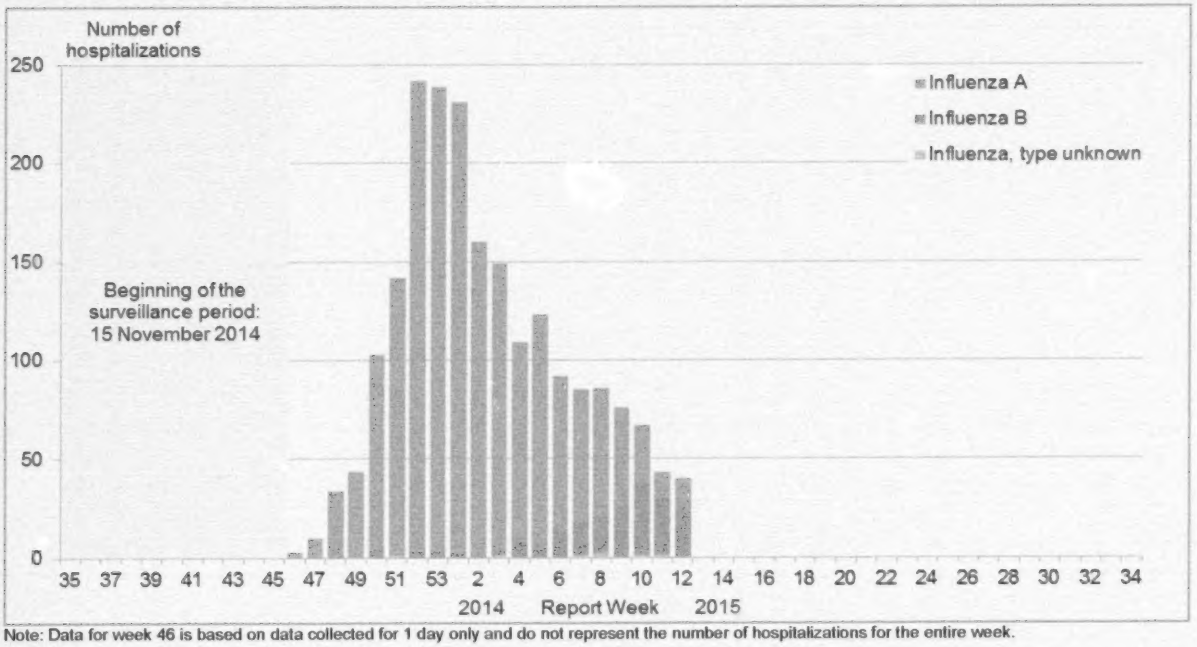
[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections. UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Figure 8 – Number of cases of influenza reported by sentinel hospital networks, by week, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



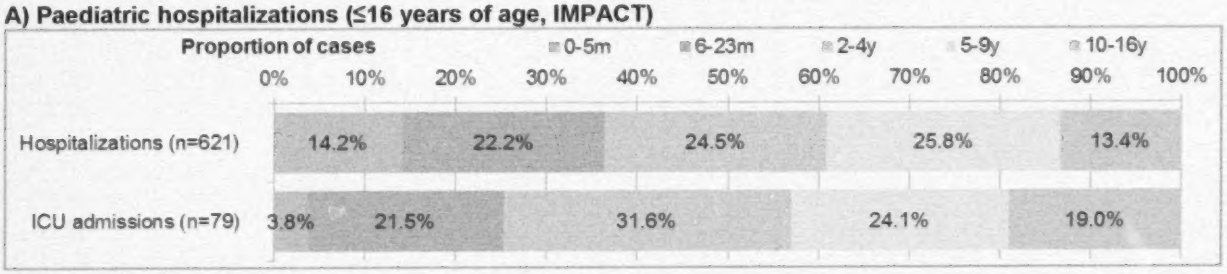
B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



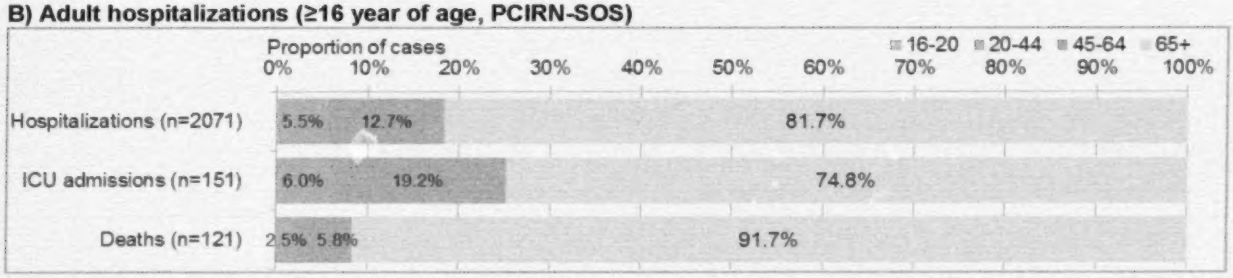
Note: Data for week 46 is based on data collected for 1 day only and do not represent the number of hospitalizations for the entire week.

Figure 9 – Percentage of hospitalizations, ICU admissions and deaths with influenza reported by age-group, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



Provincial/Territorial Influenza Hospitalizations and Deaths

In week 12, 148 laboratory-confirmed influenza-associated hospitalizations were reported from participating provinces and territories*, which is similar to the number reported the previous week. Of the 148 hospitalizations, 97 (66%) were due to influenza A and 97 (65%) were in patients ≥65 years of age.

Since the start of the 2014-15 season, 6,499 hospitalizations have been reported; 6,008 (92.4%) with influenza A. Among cases for which the subtype of influenza A was reported, 99.5% were A(H3N2). The majority of cases (71%) were ≥65 years of age (Table 6). A total of 340 ICU admissions have been reported to date: 54% (n=183) were in adults ≥65 years of age and 32% (n=110) were in adults 20-64 years. A total of 479 deaths have been reported since the start of the season: three children <5 years of age, three children 5-19 years, 40 adults 20-64 years, and 433 adults ≥65 years of age. Adults 65 years of age or older represent 90% of all deaths reported this season. Detailed clinical information (e.g. underlying medical conditions) is not known for these cases.

* Note: Influenza-associated hospitalizations are not reported to PHAC by the following Provinces and Territory: BC, NU, and QC. Only hospitalizations that require intensive medical care are reported by Saskatchewan. ICU admissions are not distinguished among hospital admissions reported from Ontario. Data may also include cases reported by the IMPACT and PCIRN networks. The number of new influenza-associated hospitalizations and deaths reported for the current week may include cases from Ontario that occurred in previous weeks, as a result of retrospective updates to the cumulative total. It is important to note that the hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting.

Table 6 – Cumulative number of hospitalizations with influenza reported by the participating provinces and territories, Canada, 2014-15

Age groups (years)	Cumulative (24 Aug. 2014 to 28 Mar. 2015)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-4	398	2	143	253	34	432 (7%)
5-19	266	2	130	134	56	322 (5%)
20-44	366	3	220	143	66	432 (7%)
45-64	564	4	234	326	63	627 (10%)
65+	4358	2	2024	2332	254	4612 (71%)
Unknown	56	1	52	3	18	74 (1%)
Total	6008	14	2803	3191	491	6499
Percentage[†]	92.4%	0.2%	46.7%	53.1%	7.6%	100.0%

[†] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

See additional data on Reported Influenza Hospitalizations and Deaths in Canada: 2009-10 to 2014-15 on the Public Health Agency of Canada website.

Emerging Respiratory Pathogens

Human Avian Influenza

Influenza A(H7N9): Since the last FluWatch report, no new laboratory-confirmed cases of human infection with avian influenza A(H7N9) virus were reported by the World Health Organization. Globally to April 1, 2015, the WHO reported a total of 631 laboratory-confirmed human cases with avian influenza A(H7N9) virus, including 221 deaths. Documents related to the public health risk of influenza A(H7N9), as well as guidance for health professionals and advice for the public is updated regularly on the following websites:

PHAC – Avian influenza A(H7N9)

WHO – Avian Influenza A(H7N9)

Influenza A(H5N6): Since the last FluWatch report, no new cases of human infection with avian influenza A (H5N6) virus from China has been reported by the World Health Organization. Globally to April 1, 2015, the WHO has been informed of a total of three cases of avian influenza A (H5N6) virus, including two deaths.

Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

Since the last FluWatch report, no new laboratory-confirmed cases of MERS-CoV have been reported by the World Health Organization. Globally, from September 2012 to April 1, 2015, the WHO has reported a total of 1,090 laboratory-confirmed cases of infection with MERS-CoV, including 412 deaths. All cases have either occurred in the Middle East or have had direct links to a primary case infected in the Middle East. The public health risk posed by MERS-CoV in Canada remains low (see the PHAC Assessment of Public Health Risk) and for the latest global risk assessment posted by the WHO on February 5, 2015: WHO MERS-CoV

Documents related to the public health risk of MERS-CoV, as well as guidance for health professionals and advice for the public is updated regularly on the following websites:

PHAC – Middle East respiratory syndrome coronavirus (MERS-CoV)

WHO – Coronavirus infections

International Influenza Reports

World Health Organization influenza update

World Health Organization FluNet

WHO Influenza at the human-animal interface

Centers for Disease Control and Prevention seasonal influenza report

European Centre for Disease Prevention and Control - epidemiological data

South Africa Influenza surveillance report

New Zealand Public Health Surveillance

Australia Influenza Report

Pan-American Health Organization Influenza Situation Report

FluWatch Definitions for the 2014-2015 Season

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

ILI/Influenza outbreaks

Schools: Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of influenza season as it may be the first indication of community transmission in an area.

Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but not limited to long-term care facilities (LTCF) and prisons.

Workplace: Greater than 10% absenteeism on any day which is most likely due to ILI.

Other settings: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case; i.e. closed communities.

Note that reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions.

Influenza/ILI Activity Levels

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†

3 = Localized: (1) evidence of increased ILI*;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region**†

4 = Widespread: (1) evidence of increased ILI*;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region**†

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.

** More than just sporadic as determined by the provincial/territorial epidemiologist.*

† Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.

This report is available on the Public Health Agency website at the following address: http://www.phac-aspc.gc.ca/fluwatch/index.html.

Ce rapport est disponible dans les deux langues officielles.